

In the Claims:

Please amend Claims 1, 2, 3, 6, 12, 14, 15, 16, and 41 to read, as follows.

Note that all the claims currently pending in this application have been reproduced below for the Examiner's convenience.

3 1. **(Currently Amended)** An optical waveguide comprising:
a partial cylindrical portion having an elongated profile and being formed of
a material transparent to light propagating along said partial cylindrical portion; and
a plurality of end portions, each of said plurality of end portions having an
approximately partial spherical profile smoothly joining said partial cylindrical portion,
and being formed of a same material as the a material of said partial cylindrical portion,
whereby ~~the~~ light propagates along said partial cylindrical portion and said
plurality of end portions and is totally reflected at a boundary surface contouring said
partial cylindrical portion and said plurality of end portions.

2. **(Currently Amended)** An optical waveguide according to claim 1,
wherein said partial cylindrical portion includes a curved part having an approximately
partial spherical profile smoothly joining a pair of straight partial cylindrical parts ~~portions~~
of said partial cylindrical portion.

3. **(Currently Amended)** An optical waveguide according to claim 1,
wherein said partial cylindrical portion includes a crossing part having an approximately

partial spherical profile smoothly joining a plurality of straight partial cylindrical parts ~~portions~~ of said partial cylindrical portion.

4. **(Previously Amended)** An optical waveguide according to claim 1, further comprising a cladding portion in contact with at least a part of a core consisting of said partial cylindrical portion and said plurality of end portions, said cladding portion being formed of a material having a refractive index lower than a refractive index of said core.

5. **(Previously Amended)** An optical waveguide according to claim 4, wherein said cladding portion includes a flat substrate in contact with at least a part of a flat boundary surface of said core.

6. **(Currently Amended)** An optical waveguide according to claim 5, wherein said partial cylindrical portion, said plurality of end portions, and said substrate are formed such that light perpendicularly incident on ~~to~~ said substrate through said plurality of end portions propagates along said partial cylindrical portion.

7. **(Original)** An optical waveguide according to claim 5, wherein said partial cylindrical portion, said plurality of end portions, and said substrate are formed such that light propagating along said partial cylindrical portion emerges perpendicularly to said substrate through said plurality of end portions.

8. **(Original)** An optical waveguide according to claim 1, wherein said partial cylindrical portion and said plurality of end portions are formed of a resin material.

9. **(Original)** An optical waveguide according to claim 1, wherein said partial cylindrical portion and said plurality of end portions are formed of a glass material.

10. **(Previously Amended)** An optical waveguide according to claim 1, wherein said partial cylindrical portion and said plurality of end portions are formed on one of a resin substrate, a glass substrate, a quartz substrate, and a semiconductor substrate.

11. **(Previously Amended)** An optical waveguide according to claim 10, wherein said substrate is a flexible substrate.

12. **(Currently Amended)** An optical interconnection device comprising:
a waveguide including:

a partial cylindrical portion, which has an elongated profile, and is formed of a material transparent to light propagating along said partial cylindrical portion;
and

a plurality of end portions, each of said plurality of end portions having an approximately partial spherical profile smoothly joining said partial cylindrical portion, and being formed of a same material as a material of said partial cylindrical portion, whereby the light propagating along said partial cylindrical portion and said

plurality of end portions is reflected at a boundary surface contouring said partial cylindrical portion and said plurality of end portions; and

a substrate with at least one of a light emitting device and a light receiving device disposed on said substrate, said plurality of end portions being positioned at a portion of said substrate corresponding to a position at which one of said light emitting device and said light receiving device is disposed.

13. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said light emitting device includes a surface emitting laser, which is composed of semiconductor crystal and includes an active layer sandwiched between a pair of reflective mirrors.

14. **(Currently Amended)** An optical interconnection device according to claim 12, wherein said light emitting device includes a light emitting diode (LED), which is ~~comprised~~ composed of a semiconductor crystal material and includes at least one of a pn junction and a pin junction.

15. **(Currently Amended)** An optical interconnection device according to claim 12, wherein said light receiving device comprises a pin photodiode, ~~which is composed of a semiconductor crystal material.~~

16. **(Currently Amended)** An optical interconnection device according to claim 12, wherein said light receiving device includes a metal-semiconductor-metal (MSM) optical detector, ~~which is composed of semiconductor crystal material.~~

17. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said substrate is a semiconductor substrate on which an electronic circuit for driving and controlling said light emitting device is integrated, and said light emitting device is coupled with said semiconductor substrate.

6) 18. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said substrate is a semiconductor substrate on which an electronic circuit for amplifying and controlling said light receiving device is integrated, and said light receiving device is coupled with said semiconductor substrate.

19. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said waveguide optically connects a plurality of semiconductor circuit chips, each of said circuit chips being formed on said substrate.

20. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said waveguide optically connects a plurality of chip modules, wherein in each chip module a plurality of semiconductor circuit chips is implemented.

21. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said waveguide forms an optical wiring on a circuit board in which a semiconductor circuit chip and a chip module are implemented in a mixed configuration.

31

22. **(Previously Amended)** An optical interconnection device according to claim 12, wherein said waveguide optically connects circuit boards in which at least one of a semiconductor circuit chip and a chip module is implemented.

Claims 23 through 36. **(Canceled)**

37. **(Previously Amended)** An optical waveguide comprising:
a first region having a straight partial spherical shape; and
a second region having a curved partial spherical shape, said second region being provided at an end of said first region.

38. **(Canceled)**

39. **(Previously Amended)** An optical interconnection device comprising:
a light emitting device;
a light receiving device; and
an optical waveguide for optically connecting said light emitting device and said light receiving device, said optical waveguide including a first region having a

straight, partial spherical shape, and a second region having a curved, partial spherical shape, said second region being provided at an end of said first region.

40. (Canceled)

41. (Previously Added) An optical interconnection device comprising:

an optical device; and

an optical waveguide optically connected to said optical device, said optical waveguide including a first region and a second region,

wherein said first region has a straight partial cylindrical shape, and said second region has a curved partial spherical shape and is provided at an end of said first region.